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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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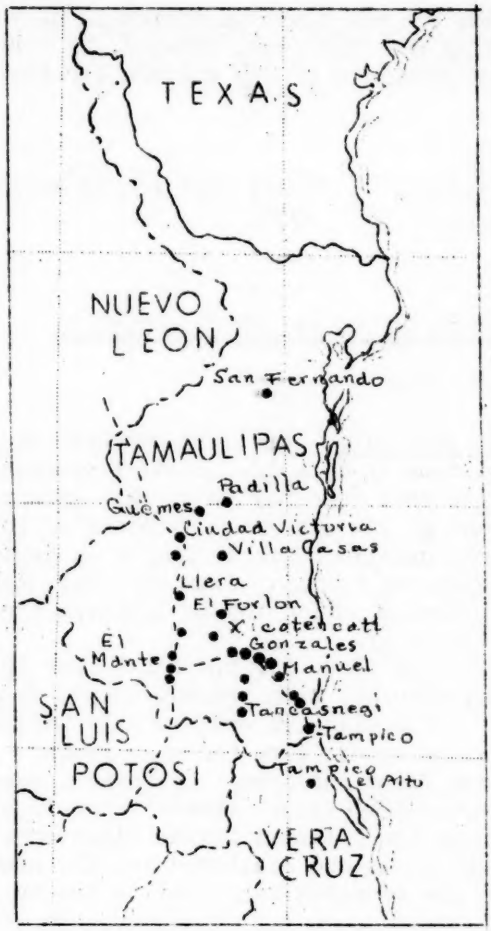
## PHYMATOTRICHUM ROOT ROT ON CRYPTOSTEGIA GRANDIFLORA WITH NOTES ON ITS DISTRIBUTION IN MEXICO

Francis J. LeBeau

As part of an experimental program on Cryptostegia grandiflora in Tamaulipas, Mexico, brief surveys were made of wild stands of this plant for disease occurrence. These were conducted during the months of February, March, April and May 1943. The outstanding disease revealed by these surveys was Phymatotrichum root rot. This disease was found in many localities where Cryptostegia was growing as an escape. It was also observed on a few six-months-old seedlings under cultivation.

In escape populations, Cryptostegia plants ranging from 1/4" in diameter at the base to 3 inches were found to have been attacked by the root rot fungus. Plants of all sizes had been killed by the disease, as shown by typical rotting of the cortical tissues and discoloration of the wood, and the presence of strands of the fungus on the surface of affected roots. Microscopic examination revealed the distinctive strands from which arose the cruciately branched acicular lateral hyphae. These strands were abundant on plants that had recently died, but were sparse, although usually present, on plants that had been dead for some time. Only occasionally were plants observed in a wilted and dying condition. Affected plants were either dead or showed no evidence of the disease except for the fungus strands on the roots. The sudden wilting and dying of plants which is characteristic of the disease when it is developing actively, was seen only in one locality in the middle of April. It appeared that disease development was not rapid in February or March, probably owing to low temperatures and soil moisture. The more characteristic effects of root rot were observed in an irrigated field of alfalfa. This field showed no evidences of root rot from November until April but in the latter part of April sudden wilting and dying of plants appeared in several spots. Similar dying of avocado and sweet potato also was observed in the same field. Of a group of about 150 Cryptostegia seedlings that had been transferred to the field from pots in October, 1942, several succumbed to root rot as early as the latter part of December, or when they were about 4 months old. Usually the first outward sign of infection was a yellowing of the lower leaves, the yellowed leaves soon abscissing. This yellowing and abscission continued until the plant was completely defoliated. In some cases the stem remained alive for some time before drying up. The root system of affected plants usually was badly rotted even before the first appearance of above-ground symptoms. During the latter part of April a number of the seedlings did not show such slow dying, but instead suddenly wilted as is more typical of root rot. It is expected that with advancing temperatures and increasing soil moisture a more vigorous development of root rot will result in more of the rapid killing.

While these observations indicate that C. grandiflora is subject to phymatotrichum damage, exact data on relative susceptibility and the possible loss from root rot in field plantings are lacking. These points are now being studied. It is recommended, however, that heavily




Distribution of Phymatotrichum omnivorum in Tamaulipas, Mexico. Each black dot represents an area in which root rot was found.

infested soil be avoided in selecting areas for any extensive plantings of Cryptostegia.

In the course of observations on Cryptostegia, information was obtained on general root rot distribution in Tamaulipas and the extreme northern part of the State of Vera Cruz, Mexico. The occurrence of root rot along the Rio Grande River and the East Coast of Mexico has been indicated on the basis of scant data (1). In the surveys reported here, the disease was found in 13 separate localities from San Fernando, which is about 100 miles south of Brownsville, Texas, southwest into the northern corner of the State of Vera Cruz. (Figure 1) The indicated locations are widely separated because of the sparse distribution of susceptible crop plants, and because native plants which harbor the disease generally show no external symptoms. The observations which served as the basis for Figure 1 were mostly on Cryptostegia and castor bean.

A very extensive and heavily infested area was encountered in the prairie region in the vicinity of Manuel and Gonzalez, Tamaulipas. Here several hundred acres of castor bean, reportedly planted on virgin prairie, were severly affected by root rot. While certain spots appeared to be suffering more than others, the disease seemed to be generally prevalent and destructive. In additional observations southwest of Manuel, an area of heavy infection was found in several thousand acres of prairie which were being plowed up for the first time. The prairie supported a good population of 2 native shrubs that were generally infected, but showed no evidence other than the presence of fungus strands on the roots. The prevalence of the fungus in this area is indicated by the fact that it was necessary to pick up only 2 or 3 root stalks at any one point before the root rot fungus was found.

These observations leave little doubt that the root rot fungus is indigenous in the State of Tamaulipas, Mexico. It seems probable that a considerable portion of the black alkali soil, characteristic of the Coastal plains of Mexico in Tamaulipas and other Gulf States, also has

the fungus present. Recently, root rot was found on cotton in close proximity to a Cryptostegia planting near Culiacan, Sinaloa, in western Mexico. Surveys have not been conducted in the western territory as yet.

Reference:

Streets, R. B. Phymatotrichum (cotton or Texas) root rot in Arizona. Arizona Agr. Exp. Stat. Tech. Bull. 71. 1937.

DIVISION OF RUBBER INVESTIGATION

## FURTHER OBSERVATIONS ON WHITE ROT OF ALLIUM IN LOUISIANA

E. C. Tims

The white rot fungus (Sclerotium cepivorum) was first reported on garlic, shallot, and onion in Louisiana in 1942 1/. Further observations made on the disease during the past year may be of some general interest. The shallots, onions, and garlic are grown here during the fall, winter, and spring. Plantings usually begin in August or September and harvesting is usually completed in May. Thus the susceptible hosts are exposed to the white rot fungus during the cool season when the disease is likely to be most active 2/.

Although white rot was reported in the State for the first time in 1942, it seems probable that the disease has been present in St. James Parish for some years. One farmer whose place is most heavily infested insists that he has had the disease on his farm for many years. Other farms in the vicinity of those found infested the previous season were examined during the winter of 1942-1943. Several additional infested areas were found adjacent to the infested fields discovered last year. But most of the infested areas are scattered and the heavily diseased portions of the fields are comparatively small - two to three acres at most.

Just why the disease is confined principally to certain definite well-defined areas is a matter of considerable interest. The disease has been found in the most severe form in low, comparatively poorly drained areas, as well as on ditchbank rows where drainage is best. One of the possible limiting factors might be soil reaction. Preliminary tests showed that S. cepivorum grows very poorly above pH 7 on certain liquid culture media. The pH level of several soil samples from different white rot affected fields ran from 5.5 to 6.6. However, the soil reaction of surrounding non-infested areas did not vary appreciably from that of the infested areas. No white rot was found in fields where the pH was at or above 7.

The first white rot infected plants of the 1942-43 season were found December 9 in a shallot field where the disease was severe the previous

1/. Tims, E. C. White rot of Allium in Louisiana. Plant Dis. Reptr. 26: 219-221. 1942.

2/. Walker, J. C. The influence of soil temperature and soil moisture upon white rot of Allium. Phytopath. 16: 697-710. 1926.

season. At this time several diseased plants were removed from the row and healthy shallots set in the same holes. When the latter plants were examined on January 1, several were severely diseased, two of them being dead. The roots were almost completely decayed and numerous sclerotia had developed around the bases of the infected plants. This shows that shallot plants in the field may be killed by white rot in 22 days when conditions are favorable. The soil was quite wet and partially water-logged during the period when the disease was most severe.

White rot was found for the first time affecting the wild onion, Allium canadensis, during the past season. The diseased plants were found along the headlands and ditchbanks adjacent to areas where the disease was prevalent on commercial garlic plantings in St. James Parish. The symptoms of white rot on wild onion were quite similar to those on shallot or garlic except in most cases the plants were not completely killed. The roots were badly decayed. There was a basal rot of the bulbs and sclerotia were present on the decaying portions of the plants.

The causal fungus isolated from diseased wild onion plants was indistinguishable from cultures of S. cepivorum obtained from garlic and shallot. No inoculations were made with pure cultures of the white rot fungus. But wild onion plants placed in pots and inoculated with macerated shallot plants that were severely diseased died within a few weeks with typical symptoms of white rot. The fact that white rot has been found affecting wild onions in areas where shallots and garlic are grown indicates how difficult it may be to eradicate the disease even though the growing of susceptible hosts is discontinued for many years.

## DISEASES OF ONION, SHALLOT, AND GARLIC IN LOUISIANA DURING THE 1942-43 SEASON

E. C. Tims

The common diseases of onion, shallot, and garlic were much more severe in Louisiana during the 1942-43 season (from September 1942 to May 1943) than usual. A severe outbreak of onion mildew occurred in the most important bulb producing area of the State. Many onion seed fields were almost a total loss as the result of mildew (Peronospora destructor) and the black stalk rot disease associated with Macrosporium parasiticum [Alternaria parasitica]. Severe losses to shallot growers resulted from widespread growth failure (cause undetermined) in the lower Mississippi River parishes, and pink root (Phoma terrestris) caused some losses almost everywhere that shallots were grown in the State. Premature dying of garlic plants (cause undetermined) resulted in losses to some growers. Although white rot (Sclerotium cepivorum) infection is confined to comparatively small areas in St. James Parish, the disease caused severe damage to shallots and garlic on a few farms.

Onion mildew (Peronospora destructor) occurred in epiphytotic proportions in Louisiana in 1943, being much more severe than in 1941 when it caused severe losses. The epiphytotic was confined to the lower Mississippi River and Bayou Lafourche region, being especially severe in

Lafourche and Terrebonne Parishes. The disease caused relatively little damage to onions in most other sections of the State, although scattered infections were found. The acreage of onions had been increased to more than 1,500 in Lafourche Parish, a large portion of which were severely damaged.

Little effort was made to control mildew on most of the farms. However, one farmer sprayed a block of 13 acres at approximately weekly intervals with Bordeaux mixture, beginning before any mildew showed up. He did not get good coverage due in part to the fact that he did not use enough spray material and the spray did not stick well on the onion leaves. Mildew started in one corner of the field and swept across in the direction of the prevailing wind in a period of about ten days. The disease became severe at the time the bulbs were beginning to make their principal growth, and the final yield was less than half of normal.

Dying of onion seed stalks (Peronospora destructor, Macrosporium parasiticum [Alternaria]). Severe losses were suffered in the onion seed producing areas from premature dying of the seed stalks. Mildew caused lesions on many seed stalks and in some cases caused a complete collapse of the affected plants. In most cases the mildew-affected plants were soon infected by the "black stalk rot" fungus, Macrosporium parasiticum [Alternaria]. Purple blotch, Macrosporium [Alternaria] porri, was found on onion seed stalks occasionally during the winter.

Shallot growth failure (undetermined). The yields of shallots in most of the producing areas were much below normal the past season. Some fields that usually gave from 50 to 65 barrels per acre yielded only 10 to 12 barrels. The growth failure was most conspicuous in areas where shallots have been grown for many years, but losses were severe in some of the newer producing areas. The cause of this widespread failure is obscure. There was no evidence that any of the well-known shallot diseases was involved except in a few sections where pink root was severe and the very limited areas affected by white rot. There was some evidence of differences in source of seed. In general the shallot sets grown away from the regular commercial shallot-producing areas gave much better yields than the home-grown sets. Unfavorable weather conditions at planting time apparently had some effect on the yields. A heavy rain (12-14 inches) within a period of about 36 hours fell in one section soon after many fields were planted. The plants in some of these areas never did grow off normally.

Pink root (Phoma terrestris) is the most widespread and serious disease of shallot in the State. Some fields are so severely affected that shallot growing is no longer profitable. One field of two acres near Convent was a total loss this year because of the heavy pink root infection. Not a single bunch of shallots was harvested from this field. The grower claimed that he got a good yield of shallots there two years before. The losses due to pink root are difficult to evaluate because of the variation in severity of the disease. The range of symptoms runs from plants badly stunted or killed to those with only a few diseased roots and very slightly stunted.

Premature dying of garlic (associated with Helminthosporium allii) was first observed in a small planting of about half an acre near Schriever

in April 1942. The tops of the affected plants were dead and shrivelled almost as though a fire had swept over them. Practically all the plants in one section of the plot were affected and scattered ones in the remainder. No fungus was found on the dead leaves except after they had been dead for some time and a Macrosporium [?Alternaria] developed on the decaying tissues. The roots of most plants were in good condition and the bulbs were apparently healthy, but the outer scales on most of the bulbs of the affected plants were blackened where they were in contact with the soil. After some of the bulbs were removed from the very heavy black soil they left a black imprint where the outer scales were in contact with the soil. The black color on the outer scales and in the soil was caused by the profuse development of dark spores and mycelium of a fungus which was tentatively identified by J. A. Stevenson of the U.S. Department of Agriculture as Helminthosporium allii. The fungus was found only on the dry outer scales and among the roots at the base of the plants. Some of the roots were blackened where they came in contact with the affected scales, but there was little evidence of injury to the roots.

Preliminary inoculation tests were made by planting healthy garlic cloves in sterilized soil inoculated with pure cultures of H. allii. The outer scales of the small bulbs produced in pots were blackened in a similar way to those found in the field, but there was no dying of the tops. It seems rather unlikely that this fungus is the principal cause of the premature dying of garlic, but it is quite regularly associated with the diseased condition.

On April 2, 1943, another planting of garlic was found near Thibodaux in which 9% of the tops were dead. This field was on the bank of Bayou Lafourche in light, well-drained soil. Many of the plants had evidently been dead for some time because the common Macrosporium [?Alternaria] found on dead onion and garlic plants had developed on the decaying leaves. The bulbs were normal in size and the individual cloves in many of them had germinated, sending up small, green shoots among the dead leaves. Soft rot was found in some of the bulbs. But about 95% of the bulbs in the affected field showed the black discoloration on the outer scale associated with H. allii.

LOUISIANA AGRICULTURAL EXPERIMENT STATION

## PROGRESS OF POTATO LATE BLIGHT

The Long Island crop is maturing with apparent loss from late blight (Phytophthora infestans). In general, early potatoes from New Jersey and Maryland to Colorado escaped damage. However, in spite of the unfavorable weather that has prevailed up to now, the disease has maintained itself and even made some progress, and with a change to cool moist weather could do great damage to later crops. Dr. I. E. Melhus in his report to the Upper Mississippi Valley War Service Committee forecasts probabilities of loss in that region as follows:

"If we can avoid late blight losses we will harvest the biggest crop produced during the last 2 decades. The early potato crop will be marketed with little loss from late blight, but this will not be true of the late crop. Our early crops always escape. It is now clear that late

blight will do considerable damage to the foliage as the season advances and there will be considerable tuber rot unless the weather turns hot and dry immediately. The potato crop in most areas was planted later than usual which means that it will go into the fall in a vigorous growing condition with a great deal of foliage, affording an opportunity for a large spore load to sift down into the soil. No amount of spraying can prevent this." (August 4)

Late blight has appeared in Massachusetts, North Dakota, and South Dakota. Some spread is reported in Iowa and new infections in Wisconsin. Infections are widespread in upstate New York but further development has been slow and damage is slight as yet. However, August and September weather is likely to favor the disease according to Dr. M. F. Barrus. The outbreak in southeastern West Virginia has not decreased in severity. No late blight has been found in Indiana or Illinois. Ordinarily it would not be expected in either State, but last year's epidemic affected Illinois, and in a letter to county agents, Dr. L. R. Tehon emphasizes the abundance of potential inoculum and the importance of keeping fields protected to prevent loss from infection that might follow a change to favorable weather conditions. He concludes "With the wartime need for food so great, preventable losses from plant diseases should not be allowed to occur. This year, don't trust the weather; keep the potato fields sprayed!"

The accompanying table summarizes temperatures in relation to late blight spread, from information in the Weekly Weather and Crop Bulletin for the weeks ending August 3 and August 10. Rainfall was somewhat more favorable over varying areas.

Mean Temperature in Relation to Potato Late Blight Spread

| Favorable (Up to 75° F.) | Unfavorable (Above 75° F.) | Change from Preceding week |
|---|---|---|
| Week ending August 3: | | |
| New England, New York except in southeast | Southeastern New York, New Jersey, southern and western Pennsylvania | Increase |
| Northern Pennsylvania | | About same |
| Eastern West Virginia | Central Pennsylvania | Decrease |
| | Western West Virginia | No change |
| Northwestern Ohio | Ohio except northwest, Indiana | Increase |
| Michigan | | Decrease in south, increase in north |
| Wisconsin | Illinois | About same |

| Favorable (Up to 75° F.) | Unfavorable (Above 75° F.) | Change from Preceding week |
|---|---|---|
| | Southeastern Minnesota | No change |
| Norther Minnesota, North Dakota | | Decrease |
| | Iowa | Mostly increase |
| | South Dakota | Same in east, decrease in west |
| | Nebraska | Increase in east, decrease in north and west |
| | Colorado | Increase |
| Week ending August 10: | | |
| New England, New York, except in southeast; southeastern New Jersey; northern and western Pennsylvania; eastern West Virginia; northern Ohio; northern Indiana; Michigan; Wisconsin; Minnesota; northern Iowa; North Dakota; eastern South Dakota; northern Colorado | Southeastern New York; northern New Jersey; southern Pennsylvania; western West Virginia; central and southern Ohio; Indiana except in north; Illinois; southern Iowa; western South Dakota; Nebraska; southern Colorado | A general decrease, except in southern Pennsylvania and in western South Dakota, no change |

Following are the reports received:

MASSACHUSETTS: Late blight was first found this year in Massachusetts by Dr. O. C. Boyd and Dr. Thomas Sproston on July 27 in Hampshire County. Cobblers and Chippewas will probably suffer no loss but the poorly sprayed fields of Green Mountain will undoubtedly suffer losses of varying degrees. (Robert C. Cassell, Emergency Plant Disease Prevention Project, August 9).

NEW YORK: Dr. Karl Fernow found late blight about July 20 at Georgetown, Madison County, at New Hartford, Oneida County, and at Gabriels, Franklin County. It has also been reliably reported from muck areas in Wayne County (this being the first report of its occurrence in upstate New York), at Plymouth, Chenango County, at Waterville, Oneida County, and in Ulster County. Dr. D. Reddick found it last week in dump piles at

Fillmore, Allegany County, and in a field on the hills of Livingston County. Ralph Morgan and I found it present on July 30 in 2 muck fields at Elba, Genesee County.

There can be no question about the disease being well established throughout many parts of the State. As yet, little damage has occurred. If the weather throughout August and early September is hot and dry, there will be but little damage. The probabilities are against this, however. Cold nights with heavy dews will be favorable for the continued development of the blight fungus. Prolonged rains during this period will result in a rapid spread of the disease. (M. F. Barrus, Cornell University. August 2).

Besides the upstate locations mentioned by Dr. Barrus, late blight has been reported in Cayuga County at Port Byron. The disease is widely distributed over New York State but up to the present has not become severe. However, the type of weather conditions that have very recently begun to develop favor the pathogen and should these conditions continue to prevail the disease could become very destructive in upstate New York. According to Dr. D. Reddick, the potato crops in Nassau and Suffolk Counties of Long Island are out of danger since vines are dying naturally and since tuber infection is rather uncommon in potato fields of these 2 counties. (Leon J. Tyler, Emergency Plant Disease Prevention Project. August 7)

MARYLAND: I found late blight in an unsprayed potato field in Garrett County [in extreme western Maryland adjacent to Preston County in West Virginia]. The disease was confined to the portion of the field adjacent to the woods. Potato growers have been warned to keep their fields thoroughly covered with Bordeaux mixture, since the disease is likely to spread if weather conditions continue to be favorable for its development. (R. A. Jehle, University of Maryland. August 5)

WEST VIRGINIA: On July 29 late blight was found in all fields examined in Barbour, Pocahontas, Preston, and Randolph Counties. Loss was variable, being very light in southern Preston County and ranging to complete death of vines in Pocahontas County. In one well-sprayed field in the latter county the disease was widely distributed although the actual leaf area lost was slight. Tomatoes were affected in a few cases. In one garden, adjacent to severely blighted potatoes, possibly 10% of the leaves on staked tomatoes were infected. Many fields located in valleys showed almost complete killing due to early blight [Alternaria solani] and hopperburn so that the loss from late blight would be negligible.

Fields examined on higher levels in Preston County August 5 and 6 showed variable stages of infection. On West Virginia Route 7 through Kingwood to Hopemont late blight was limited in unsprayed fields to a few focal points of infection and to occasional scattered leaves. In the vicinity of Aurora, a few miles south of Route 7, one poorly sprayed field showed approximately 75% of the leaves killed by late blight, a yield loss in this instance of at least 75% since this was a very late-planted field. Heavily sprayed or dusted fields (75 lbs. of dust per application at 5- to 7-day timing) showed traces of late blight well scattered throughout. On occasional vines out of the path of the dust or

spray stream, and in row ends where traction-powered machinery gave poor coverage, up to 50% of the leaves were dead. In this section weather has been such, with very frequent rains, that control has been difficult. If the weather improves slightly it is believed that these heavily treated fields can be protected sufficiently so that only slight loss in yield will be suffered.

East of the Allegheny Mountains the rainfall has been light. Here no late blight was observed but many fields are dead from early blight and hopperburn. The estimated yield in these fields, few of which are protected by fungicides, is approximately 30% of that which would have been obtained with good protection.

To summarize: On high ground in the Allegheny Mountain section of the State, late blight reached epiphytotic proportions some 2 weeks earlier in the southern part than approximately 100 miles farther north. Although it is now widespread in some sections, adequate sprays or dusts are providing fair control. Loss in unsprayed fields on high ground will approach 75%. (C. F. Taylor, Emergency Plant Disease Prevention Project. August 7)

INDIANA: So far conditions have been adverse to the development of late blight of potatoes in Indiana. Our early planted upland potatoes are now maturing. Limited examinations of such plantings revealed no blight. Owing to excessive rains in May potatoes were planted much later on muck soils than usual. Most were planted at the very last of May instead of the first. Examination has revealed no blight on muck soil plantings. (R. W. Samson, Purdue University Agricultural Experiment Station, July 26. Quoted by I. E. Melhus, August 4)

ILLINOIS: So far this season, weather has been generally unfavorable for late blight. High temperatures and scant rainfall do not favor its development. In a recent trip through northwestern counties, where Illinois' largest acreages of late potatoes are grown, G. H. Boewe made careful search in some 30 fields in 8 counties, without finding any late blight infection. This examination was early. With a change in weather, late blight could still develop and do great damage. That potential infection is available in abundance seems certain from the fact that much of this year's crop is being grown from seed home-grown where blight was destructive a year ago. (L. R. Tehon, Illinois Natural History Survey. August 6).

WISCONSIN: It is dry and warm in the Madison area. In Langlade County sporulations were found on stem and leaf lesions. Late blight is reported in the Marinette area also [both of these areas are in northeastern Wisconsin; Marinette on Green Bay]. (R. C. Larson, University of Wisconsin, July 31. Quoted by I. E. Melhus)

IOWA: On August 3, I revisited the 2 fields in which I found late blight on July 23. Blight had become general throughout the fields and fully 25% of the leaves were diseased. Three adjoining fields free from late blight on July 23 showed 10% of foliage infection. Other fields

free on July 23, 3 to 5 miles away, showed 10% foliage infection. There was every indication that the crop would be cut 50%. Two other potato districts 20 and 35 miles away were examined but found to be free from the disease. (I. E. Melhus, Chairman, War Service Committee, Upper Mississippi Valley Plant Pathologists, report of August 4)

NORTH DAKOTA: I spent July 30 and 31 in the potato fields between Fargo and the Canadian border in the Red River Valley. Small traces of late blight may be found in a few fields but it is not spreading as yet. It was gratifying to see so many growers using fungicides. Many fields have had 3 applications with growers ready to apply more copper if necessary. We may yet have a serious outbreak of late blight, but I feel that this region will be much better prepared to deal with an epidemic than it was last year. (W. E. Brentzel, North Dakota Agricultural Experiment Station, August 2. Quoted by I. E. Melhus)

SOUTH DAKOTA: I found late blight tonight on North Dakota #1, apparently a very susceptible seedling, and a trace on Early Ohio, Mohawk, and one or two other seedlings in the experimental plots. So far there is none in the late blight planting or in our mid-May planting of Bliss Triumph. We are surprised and still cannot quite see how there can be an outbreak such as last year's. Even now we are having hot, dry days. Of course there are dews which doubtless account for the infection. (W. F. Buchholtz, South Agricultural Experiment Station, July 30. Quoted by I. E. Melhus)

COLORADO: Dr. Wm. A. Kreutzer on July 30 writes: "The early potatoes in the Gilchrist area are being harvested so we have only the later areas for which to be concerned. There is little danger of blight at present in the late area. The weather is warm and dry. Our most critical period will be during the later part of August and early September. It is then that we expect rain and lower temperatures." On August 3 Mr. W. J. Henderson says "Dry weather conditions still showed late blight inactive today. The Gilchrist area is nearly through harvesting."

MANITOBA AND SASKATCHEWAN: Dr. Melhus quotes negative reports from these two provinces of Canada.

## REPORTS ON OTHER POTATO DISEASES

MASSACHUSETTS: (Hampshire and Franklin Counties). There is a light amount of purple top (aster yellows virus) in some fields. It is worse this year than usual.

Rhizoctonia (R. solani) is light to moderate, but there is an unusual amount of stolon girdling with consequent reduction of set of tubers this year.

Attack by Fusarium wilt (F. oxysporum) is generally light, but at least 10 to 15% infection was observed in one field of Russets. (Robert C. Cassel, Emergency Plant Disease Prevention Project. August 9)

SEED-PIECE DECAY IN NEW YORK: Seed-piece decay has been very prevalent in most potato-growing sections of the State as indicated by poor come-up. This decay has been attributed to Fusarium spp. Whatever the cause it is held by Dr. Reddick that unfavorable weather conditions produced a soil and air environment which inhibited proper corking-over. (Leon J. Tyler, Emergency Plant Disease Prevention Project. August 7)

The State College of Agriculture Weekly News Letter gave reports of seed-piece decay in several counties. A typical early report is by Ralph D. Morgan for Genesee County, as follows: "On the muck, there still remains a very substantial acreage to be planted, both in the drier sections and in the wetter parts. Seed that has been cut for over 2 months is showing considerable decay with prospects of many poor stands because of partially decayed seed. Also, potatoes that have been planted have, in many instances, been covered with water with indications that many fields will show only a partial stand, if any." (June 7). Later, (July 12), he reported "Several stands of certified Sebagoes are very poor, because of seed-piece decay, under conditions that resulted in normal stands of Katahdins and Rurals." From Orleans County A. G. West reported (June 28), "Some early planted potatoes never came up. Stands of later planted fields look fair but many skips are due to seed-piece rot." Similar conditions were reported from other counties.

COLORADO: Together with Dr. John G. McLean of the Colorado Experiment Station I examined potato fields in the San Luis Valley. Rhizoctonia (R. solani) and blackleg (Erwinia phytophthora) affected from a trace to 20% of the plants in some fields. Rugose mosaic (virus) occurred in practically all fields inspected, infection ranging from 10% to 20%, and 5% of leaf roll was estimated in some fields. (E. W. Bodine, Emergency Plant Disease Prevention Project, August 9)

## REPORTS ON TOMATO DISEASES

MASSACHUSETTS: Light amounts of Cladosporium leaf mold (C. fulvum) are just beginning to show up in the Connecticut River Valley. In central and northern Worcester County the lower leaves of plants were generally affected by moderate amounts of early blight (Alternaria solani), and a little blossom-end rot (physiological) was observed on only a few plants. (Robert C. Cassell, Emergency Plant Disease Prevention Project, August 9).

NEW YORK: (Reports from State College of Agriculture Weekly News Letter for dates indicated). A long period of cold weather, heavy rains, and water-logged soils, delayed transplanting until much later than usual. Plants were held in greenhouses so long that they suffered from crowding. In Niagara County Botrytis attacked the stems of the crowded plants, according to D. M. Dalrymple (May29). After planting in fields heavy rains and soaked soils resulted in slow growth and some loss of plants. Paul C. Gillette reported from Ulster County (June 21), "Tomato acreage in the county is as large as usual but severe losses in plants

have been incurred due to the unfavorable weather and labor conditions. Many growers have replanted 2 or 3 times because of the heavy rains. One grower reported the loss of 15,000 out of a lot of 50,000 plants."

Later in the summer nitrogen deficiency due to leaching by the earlier heavy rains became evident in some areas.

Early blight (Alternaria solani) is the most generally reported disease. Arthur G. West reported that a few fields in Orleans County planted with southern-grown plants were badly attacked, resembling one-year-old asparagus beds because of the severe defoliation, while locally raised plants were free from disease (June 28). A slight amount appeared in some plantings in Ulster County by July 7, and a month later it was present in most fields, according to Claude Gillette (July 12, August 9). By the beginning of August it was reported in Albany, Dutchess, Genesee, Wayne, Monroe, and Erie Counties, although it was not said to be serious.

Fusarium wilt (F. bulbigenum lycopersici) appeared in plantings of locally greenhouse-grown plants in Ulster and Niagara Counties, according to Claude Gillette (July 12) and D. M. Dalrymple (July 26).

Bacterial canker (Corynebacterium michiganense) was found in one field on Staten Island where diseased plants had been introduced last year, according to A. A. Foster (July 19). Claude Gillette reported canker as appearing on fruit in Ulster County (July 19), and a disease thought to be this was found in gardens in Genesee County, according to E. B. Pattison (August 2).

Late blight (Phytophthora infestans) and leaf spot (presumably Septoria lycopersici) were reported as appearing in Ulster County plantings by Claude Gillette, July 26.

Mosaic (virus) was found in a few fields in Genesee and Ulster Counties, according to E. B. Pattison (August 2), and Claude Gillette (August 9). In the latter county scarcely any plants escaped the disease in the fields affected. Cucumber mosaic in greenhouse-grown plants was reported from Staten Island by A. A. Foster, as follows (May 3): "Greenhouse-grown tomato plants from some florist's greenhouses this year show a large amount of cucumber mosaic symptoms. This new practice among growers will have to be accompanied by care in the selection of the flower crops to be grown in the same house."

At the end of July and beginning of August blossom-end rot was common in Erie and Ulster Counties.

A wilt of undetermined cause was reported in home gardens in Monroe County by Ralph G. Palmer (August 2)

NEW JERSEY, DELAWARE, AND MARYLAND: Fusarium wilt was observed in all 3 States. Near Burlington County, New Jersey, several fields were seen with 2 to 5% wilt, and one field of pear-shaped red and yellow tomatoes showed about 18 to 20%. In Delaware, near Magnolia, Kent County, 25 to 30% of the plants were affected in a field of the Rutgers variety. This field had been planted to tomatoes last year. An adjoining field of the same variety showed only 5% wilt. Near Cambridge in Dorchester County, Maryland, several fields of canning tomatoes that had been top-dressed with refuse from tomato peeling tables were affected. The most badly diseased fields showed 51% infection, and 2 other fields averaged 5 to 10% wilted and dead plants.

Bacterial canker was found in a field near Rhodesdale, Dorchester County, Maryland. In one acre of the field half the plants were diseased, and 2 to 4% infection was scattered through the rest of the field. (E. A. Walker, Emergency Plant Disease Prevention Project, August 2-7).

## DISEASE AND WEATHER INJURY TO ARKANSAS CROPS

V. H. Young

Several trips to Eastern and Central Arkansas during May, June, and July have convinced me that crop conditions in Arkansas as a whole are worse than they have been for several years. Dry weather in April, severe floods and continued wet weather in the last half of May and in early June and severe drouth conditions more recently have greatly lowered crop prospects in my opinion.

Freezing injury destroyed practically all of the Elberta peach crop in the State and so far as I can find out the yield of all other varieties was quite limited. Leaf curl was prevalent on non-sprayed trees.

Frosts during the blossoming period greatly reduced the strawberry crop.

Continued wet weather during the critical period before and after blooming of grapes prevented proper timing of sprays and many vineyards have suffered severe black rot [Guignardia bidwellii] injury. At Altus in the Arkansas River Valley a colony of German-Swiss grape growers seems to have suffered severe losses from black rot, some vineyards being practically a total loss. In Benton and Washington Counties damage appears less severe.

Truck crops in Northwestern Arkansas suffered severely from unfavorable weather and disease conditions. Blue mold [Peronospora effusa] of spinach caused some losses to the spring crop but dry weather in April checked its spread and itself greatly reduced yields. Many acres of truck crops were destroyed by the serious floods of mid-May in the Arkansas River Valley. Many acres of fine bottom land have probably been completely ruined by heavy deposits of sand.

Green beans for canning started out well this year but the yield was finally cut short by dry weather. A large acreage of beans was severely injured (in several cases there was a total loss) by anthracnose. Dr. J. R. Shay of this Department finds that only crops planted from certain lots of seed, said by the dealer to have been produced in Michigan from Idaho stock, were affected with anthracnose and he has been able to isolate the causal organism (Colletotrichum lindemuthianum) from some of these lots. Little if any evidence was secured for field overwintering. In certain fields where infected and clean seed was planted side by side Dr. Shay found little or no spread from rows planted with diseased seed to rows planted to clean seed. The losses from anthracnose were especially serious this year because of the need for canned green beans. One grower lost all of a 50-acre planting and there were many smaller plantings which were either a total or partial loss. Lesions on stems and leaves were particularly severe this year.

We are attempting to secure full information regarding the source of

anthracnose-infected seed and it is hoped that this information can be used by the State Plant Board as the basis for some attempt at control through appropriate regulations.

Corn with the exception of late plantings has been severely injured by dry weather in many parts of the State and there can be little doubt that yields will be low.

Peanuts were in many cases planted too late because of unfavorable rainy weather during May. In a few cases leaf spot (Cercospora spp.) was well started in early July. However, dry weather seems to have almost completely checked the spread of the disease and unless there is much rainy weather in August it is believed that it will be much less destructive than in 1942.

Rice and soybeans appear to be in excellent condition in most fields seen.

Cotton suffered especially severely from unfavorable weather conditions. Early dry weather followed by excessive rains and floods resulted in the late planting of many crops and the destruction of others. Observations in late July showed that crops on some of the best cotton land in the State were poorly developed and gave prospect of much poorer yields than the bumper crops of 1940, 1941, and 1942.

Fusarium wilt [F. vasinfectum] of cotton is perhaps less severe than in years when rainfall was heavier during late June and during July, and angular leaf spot [Xanthomonas malvacearum] promises to be of slight importance. But dry weather injury and potash deficiency symtoms were severe in many fields in Eastern Arkansas.

In every part of the State where I have been beef cattle are more plentiful than I have ever seen them, but I wonder whether there is going to be feed to carry them through the summer.

UNIVERSITY OF ARKANSAS, August 4.

## BRIEF REPORTS ON PLANT DISEASES

PREVALENCE OF BUCKSKIN IN CALIFORNIA PEACH ORCHARDS: The buckskin disease (virus) has been found recently in 27 blocks of peaches in Butte, Sutter, Tehama, Yolo, and Yuba Counties, in the Sacramento Valley, which include some of the principal peach producing districts of the State. The percentage of infected trees is low, however, in all cases inspected in any detail. Some of the totals were 6 cases in 162 trees, 5 in 775, 9 in 875, 3 in 452, and 2 in 310. Missing trees and replants from all causes are relatively small in these orchards as, for example, 6 in 452 and 7 in 875. Most of the cases seem to be of several years standing in trees 15 to 25 years old. The infected trees are usually scattered through the blocks but occasionally are somewhat clustered. Although sweet cherries are commonly found in some of these areas no buckskin seems to have been seen in them and no relation has been noted between cherries and the prevalence of the infection in peaches in any of the counties named above nor in Merced and Santa Clara Counties, where a few infected peach trees were found several years ago. There are probably no chokecherries near any of these orchards.

In contrast is a block of peach trees in Green Valley, Solano County, adjacent to a heavily infected cherry orchard. In 1936 there were 117 peach trees of which 37 were infected. Up to July 1939, 49 infected trees were found in this small block. (H. Earl Thomas and C. Emlen Scott, California Agricultural Experiment Station)

BACTERIAL SPOT OF PEACH IN MARYLAND AND NEW JERSEY: These survey notes on occurrence of bacterial spot (Xanthomonas pruni) were made during the week of August 2 to 7. In Atlantic County, New Jersey, on one farm near Hammonton, Golden East peaches being graded and packed showed severe secondary fruit spot and some primary (deep) lesions. While grading 40 baskets of fruit, about 4 baskets of culls were removed because of fruit spotting. This represents about 10% loss. Counts made at the bins before the fruit was packed in baskets showed 20 to 21% of fruit with from 1 to 5 lesions. This indicated that about 30% of the picked fruit was affected by bacterial fruit spot.

Elberta peach trees in another orchard showed 22% of the fruit and 15% of the leaves affected. Infection was most severe on the west and northwest sides of the trees. An older block nearby was not so badly affected. A young block of mixed varieties showed only 5 to 8% of fruit infection and slight leaf spot. It appears that in this district the season favored fruit infection but was less conducive to leaf infection.

In Hartford County, Maryland, slight infection of leaves and fruit was observed in a J. H. Hale orchard near Whiteford. On a farm near Norrisville peach fruit and leaves were severely affected. On 10-year-old J. H. Hale trees on this farm fruit lesions were very small and numerous and there was considerable shot-holing of the leaves. Infection on 4- to 5-year-old trees of other varieties was observed as follows:

Lizzie -- Very slight
White Delicious and Elberta -- Slight
Triogem, Sun High, Summer Crest, and Hale Haven -- Moderate
Shippers Late -- Moderate
Golden East -- Very bad, 50% of the fruit infected.

Fruit infection was heavier than leaf infection. (E. A. Walker, Emergency Plant Disease Prevention Project)

RESISTANCE OF THE NEW NON-SHATTERING ARMREDO SOYBEAN TO ROOTKNOT: Field observations have indicated that the new nonshattering variety of soybean, Armredo, developed by W. E. Bryan of the Arizona Agricultural Experiment Station from a selection out of Mamredo, is highly resistant to infestation by the root knot nematode, Heterodera marioni (Cornu) Goodey. To substantiate the field observations, Armredo was tested in the greenhouse under conditions ideal for infestation. Pots containing sandy soil were artificially infested with the root knot nematode October 2; 1942, and immediately seeded to tomatoes. The presence of many galls on the roots of the tomatoes was assurance that the nematode population was sufficient for further tests with other plants.

On May 1, 1943, Armredo, Arizona 588 (a selection from a South African nonshattering strain 34S-395) and Arizona 056 (a selection from a cross of Tokio x 54610) were each seeded in three 6-inch pots containing the above soil. Two check pots of each were seeded at the same time. As a comparison to the soybeans, the Brahma Cowpea was seeded in the same manner. The seedlings in all pots were thinned so as to leave three in each for later examination. Frequent observations of all the plants indicated that the growth of each variety or selection was approximately the same regardless of whether growing in nematode soil or nematode-free soil. All the plants were removed from the pots August 3, 1943, the soil carefully removed from the roots and an examination made for nematode infestation. Under greenhouse conditions where the environment was very favorable for the activity of the nematodes, Armredo proved to be moderately resistant for the duration of the test. Arizona 588 and Arizona 056 were heavily infested. The Brahma Cowpea was moderately resistant under these conditions. (Wm. G. Hoyman, University of Arizona)

SUMMARY OF OBSERVATIONS ON WHEAT DISEASES IN THE COLUMBIA RIVER BASIN OF THE PACIFIC NORTHWEST IN 1943: Bunt [Tilletia] was not seen except in occasional trace amounts. The increased plantings of nonresistant varieties may not be dangerous now in view of this "low ebb" and the increased use of portable cleaners and treaters. Dwarf bunt was seen only in the Goldendale area, where some spread was noted. One specific field had not shown the disease in 1941. Flag smut [Urocystis tritici] has not increased in intensity on previously charted locations but has spread into 2 fields where it was not observed in 1941. Stripe rust [Puccinia glumarum] was seen in trace amounts only and at relatively few points this year. Leaf rust [P. rubigo-vera tritici] was most severe at Sandpoint and probably overwintered there since it was more advanced (on a later crop) than at points south. Late infections occurred at Pullman and Corvallis. Stem rust [P. graminis] threatens to be very severe in the Palouse in the late spring wheats. This epidemic is definitely spreading from barberry bushes. Stem rust did not develop elsewhere this season and the spread from barberry onto wheat and other grasses (including barley and oats) is very evident. Cercosporella root rot [C. herpotrichioides] was not conspicuous in any area visited. Mildew [Erysiphe graminis] on Federation and Rex was less severe than usual.
(From a report by C. A. Suneson, Division of Cereal Crops and Diseases)

UNDETERMINED WILTING OF PEPPERS IN NEW YORK AND NEW JERSEY: Lloyd E. Curtis reported from Erie County, New York, as follows (May 8): "On pepper plants a wilting and burning of the heart leaves has been noticed particularly on the more rapidly growing and tender plants. Growers believe that it is due to spray injury. We are endeavoring to trace the cause of this trouble."

E. A. Walker observed a serious wilt due to an undetermined organism in pepper fields on a farm near Buena Vista, Atlantic County, New Jersey. He reports, "Infection of Cherry type pepper ranged from 2 to 16%, averaging 6%; of White Cap from 2 to 8% with an average of 4 to 5%; on Long

Red peppers 4% infection was observed; and on Green California Wonder 3%."

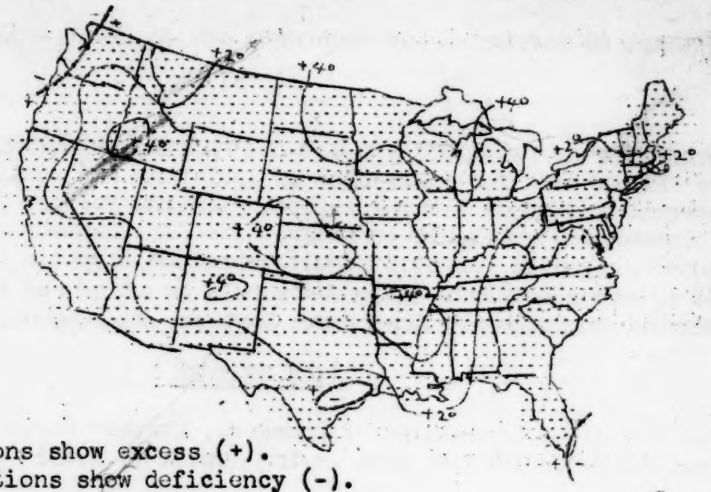
DESCRIPTION OF TECHNIQUE FOR GROWING PECTINASE-FORMING SOIL ACTINOMYCETES: Directions for the method of isolating and cultivating the potato-scab and other pectinase-forming Actinomycetes, developed by B. F. Lutman, are available on request from Dr. Lutman, who states that he would be glad to learn of results obtained from the use of this method in other regions. Requests should be addressed to Dr. Lutman at the Vermont Agricultural Experiment Station, Burlington, Vermont.

## JULY WEATHER

(From the U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending August 3, 1943)

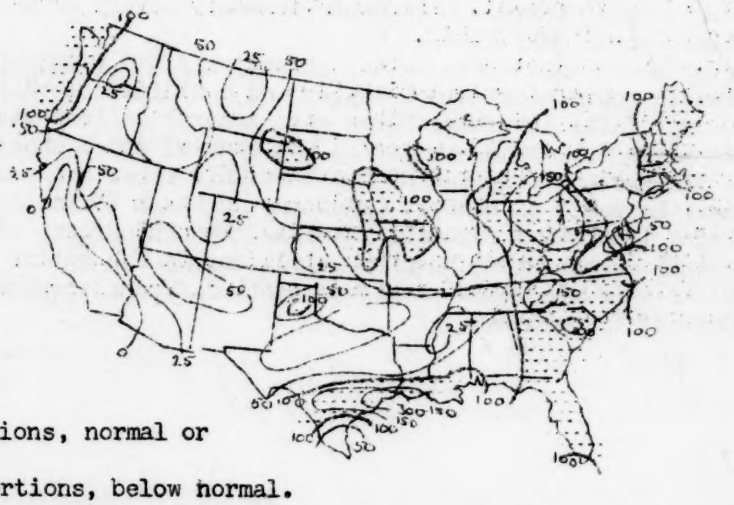
For the United States in general the weather pattern in many respects for July 1943 was quite similar to that for July 1942. Fig. 1 shows the departure of the mean monthly temperature from normal for July 1943, and Fig. 2 the percentages of normal rainfall, based on first-order stations. Near-normal warmth prevailed in the Atlantic area, more southern districts and the Pacific Coast sections, but elsewhere temperatures averaged from 2° to 4° above normal. This conforms very closely to the temperature distribution in July 1942.

Fig. 2 shows that a few areas, principally the west Gulf districts, the Southeast, upper Mississippi Valley and a limited central area had above normal rainfall; elsewhere there were general deficiencies. The driest areas, as in July 1942, appear in the central and south-central Mississippi Valley, the interior of the West Gulf area, and southern Great Plains. In parts of Kansas, Oklahoma, northern Texas, Arkansas, and some adjoining localities rainfall was less than 25 percent of normal, with some stations reporting no rain at all during the entire month. The heavy falls in west Gulf sections resulted from a tropical storm the latter part of the month.



Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 1. Departure of Mean Temperature from Normal July 1943



Shaded portions, normal or above.
Unshaded portions, below normal.
Lines show percentage of normal.

Fig. 2. Percentage of Normal Precipitation, July 1943